DOCUMENT RESUME

ED 177 104 SP 014 145

AUTHOR Popp, Jercme A.
TITLE Toward a Product-Free Process Analysis cf Teaching.
PUB DATE 79
NOTE 33p.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; *Educaticnal Philosophy; *Educational Research; Learning Processes; *Student Teacher Relationship; Teacher Behavior; Teacher Characteristics; Teacher Evaluation; *Teaching Styles

ABSTRACT

A framework is suggested for the analysis of teaching, whether for purpose of research, evaluatien, cr moral inquiry, that is an alternative tc the present form of analysis. This form seeks in the analysis of teaching those teacher characteristics that can be established as causally reactive in producing student achievement. Differing philosophical approaches to the analysis of teaching are presented and discussed. The suggestion is made that research on teaching is a tandem process: an analysis of part to whole relationships that constitute identifiable global types of teaching and an analysis of the caused effects of each type upon children. (JD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED177104

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Jerome A. Popp

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

TOWARD A PRODUCT-FREE PROCESS ANALYSIS OF TEACHING

Jerome A. Popp

Jerome A. Popp
Box 120
Southern Illinois University
Edwardsville, IL 62026
(618) 692-3156

Submitted to AACTE Outstanding Writing Awards Program: Theoretical Paper

SP 014 145

TOWARD A PRODUCT-FREE PROCESS ANALYSIS OF TEACHING

I. Introduction to the Problem.

One of the continuing problems in the study of teaching is that of establishing an ontological locus standi from which various kinds of pedagogical inquiries can be conducted. Several of what have come to be called "paradigms" for research on teaching are currently being discussed. It seems that more and more researchers are becoming concerned with what constitutes an adequate framework for pedagogical theorizing. These frameworks are also basic to the evaluation of instruction. How one conceives of teaching will obviously be a major factor in how one attempts to evaluate it. Moreover one's corception of teaching will delimit the kinds of ethical or moral questions one would consider relevant to the practice of teaching. All this is to say that one would expect that each ontological locus standi for teaching will give rise to an approach or strategy for: (a) the conduct of research on teaching; (b) the evaluation of teaching; and (c) the determination of the ethical issues considered important for teaching.

But how shall we achieve an adequate ontological framework for these efforts? Questions like this continue to be of great interest to philosophers of science. Kuhn, Popper, Scheffler, Toulman, inter alios, have given penetrating accounts of the

growth of knowledge and its meaning for further cognitive thought. Any serious efforts at solving the above question should it seems be informed by the arguments found in this philosophic literature--though of course the degree to which we should draw upon it will be controversial. These efforts should also be aware of our experience with any given ontological framework. This experience will probably enter in the form of what practiced and reflective inquirers have to say about the framework they take to be in use.

This paper attempts, after a brief review of relevant background sources, to construct a framework for the analysis of teaching, whether for purposes of research, evaluation, or moral inquiry, which is a reasonable alternative to the present situation. What will be sought is in effect a noncausal account of teaching--an analysis of teaching which originates with a conception of teaching as a totality and then proceeds to establish its elements. To my knowledge, such an approach has never been explicitly formulated.

II. The Causal Strategy in Research on Teaching

Research on teaching is dominated by the causal strategy. That is, what one seeks in the analysis of teaching are those teacher characteristics which can be established as causally reactive in producing student achievement. If we know what kind of student growth or achievement we want, we then according to the causal approach look for teacher properties or variables which are capable of producing, in a causal sense, these kinds of student growth. To be

scientific in the study of teaching has historically been seen as the searching for causes. It is common sense for many researchers to see teacher characteristics as the independent variables of research and student achievement characteristics as the dependent variables.

This paradigm or strategy for research on teaching seems to have reached its more precise explication with Rosenshine. Such research requires four steps:

(1) the development of an instrument which can be used systematically to record the frequency of certain specified teaching behaviors
(2) use of the instrument to record classroom behaviors of teachers and their pupils
(3) a ranking of the classrooms according to a measure of pupil achievement adjusted for initial difference among the classes
(4) a determination of the behaviors whose frequency of occurence is related to adjusted class achievement scores.[1]

As Doyle[2] views this strategy, which he calls the "Process-Product Paradigm," it rests upon several assumptions: (1) teacher effects are stable across time; (2) teacher effects are generalizable across settings--students, subject matter, class size, type of learning outcomes, etc,; (3) frequency of teacher behvavior is the most significant aspect of teaching; (4) the causal direction is from teacher to student, i.e., influencing flows from the teacher and is realized upon the student.

It is impossible, if these assumptions constitute the paradigm in Kuhn's sense of 'paradigm', to test directly these assumptions as if they were simply hypotheses. Paradigms of paradigmatic assumptions cannot be so directly evaluated. If data do not turn

out the way we want we do not question the paradigm--while working within it; rather, we question our data collection and/or generation methods. Only after a long history of failure do we begin to question our assumption. A crisis develops, as Kuhn sees it, which leads to a paradigm shift. Many people now believe that the product-process paradigm and its generated causal strategy is in a state of crisis. At least there seems to be a good deal of disappointment associated with the strategy.

Doyle discusses two alternatives to the product-process paradigm: the student mediating process paradigm and the culture-of-the school paradigm. The former investigates the responses of the student which are used by the student in the learning process itself. This paradigm places the student response between teacher behavior and student outcomes thus rendering the paradigm more complex than the process-product paradigm. The culture-of-the-school paradigm prescribes the study of the school situation as a complete system. Such "sociological analyses" are concerned with what students and teachers do, i.e., what are the rules of the game?

The student mediating process paradigm is based upon a causal conception of the teaching process, as is the product-process paradigm. The difference between the two is to be found in how many "stations" there are in the line of causation.

The culture-of-the-school paradigm, on the other hand, does not base itself upon causal direction. Through its search for the

rules of the game it avoids sorting out the variables of concern into independent and dependent. The difficulty with this approach is that it fails to take seriously the demarcation problem. What is studied is the classroom or the school. Good instances of teaching are considered on a par with any other teaching. One cannot be certain of the consequences of this paradigm; but there does seem to be some a priori grounds for doubting its productivity.

III. Maxwell's Metamethodology

On the heels of my concern with the problem of paradigm choice presented for educational inquiry by Kuhn's thesis about the development of science,[3] Nicholas Maxwell presented an account of what he calls "aim-oriented empiricism and claims that it poses a solution to the Kuhnian problem.[4] Maxwell's analysis is of importance for it provides a way of seeing some of what is involved in research on teaching.

The difficulty with Kuhn's thesis is that it, according to Maxwell, embraces standard empiricsm--the view that science can be free of all metaphysical assumptions. Hume showed the consequential skepticism of standard empiricsm, which could not, as Maxwell sees it, be saved by philosophers from Kant to the present. Kuhn can be seen as in effect restating Hume's problem in the "paradigm" language. For Maxwell, the attempts to suppress all metaphysical presuppositions also suppress the possibility of developing new theories in a rational manner. He offers an alternative account of

paradigms or what he calls "metaphysical blueprints". The fundamental problem for science at any stage is the selection of the best possible blueprint; this, however, is not an irrational process as many consider Kuhn to have claimed. Maxwell suggests four rules for making these decisions.[5] These metamethodological or level three rules are of obvious interest because they set out a method for dealing with the problem of paradigm choice.

(1) "Other things being equal, choose that aim, that blueprint, which is the most intelligible, simple, coherent, harmonious, explanatory, unified, beautiful."

(2) "If our science is meeting with great empirical success, then we are entitled to narrow our blueprint, if we can do it in a nonarbitrary way."

(3) "If our science is meeting with little or no empirical success then we are entitled to broaden our blueprint."

(4) "Other things being equal, choose that aim which gives the best a priori promise of leading to an empirically successful research program." A fifth rule for selecting a methodlogy of theory-acceptance is submitted; but it is not directly of interest here for, as Maxwell notes, the methodology of theory-acceptance depends upon the previously selected aim or blueprint. No attempt will be made to provide Maxwell's justification or vindication for these rules.

Maxwell admits that these rules may at times conflict one with another. "It is more than likely that the a priori Rules 1

and 4 will clash with the empirical Rules 2 and 3...".[6] There is no foolproof way of resolving such clashes. In attempting to improve the blueprint "it will be extremely important to take up hints and suggestions from the most empirically successful lines of research."[7] This will usually require constructing a new blueprint which will allow the a priori and empirical rules to apply equally well, thus removing the clash.

According to the view being considered, the development of physics is not as irrational as some see Kuhn's theory suggesting. If one looks for the modification of the basic blueprint, one finds a progressive evolution of physics--not non-cognitive floundering around. "In other words, a steady, rational continuity of development is often discernalbe in science at the level of blueprints, where all is discontinuity and revolution at the level of theory."[8]

One way of testing the blueprint thesis independently of the philosophic argument is to look for traces of it in another area of inquiry. I think that learning theory has recently and noticeably undergone such a progressive revision of blueprint. Note that I am not claiming to be a historian of psychology or any other science, but only that anyone who has been concerned with current conceptions of human nature and who desires belief grown on evidence cannot have missed the decline of a paradigm. As a way of getting at this modification in the spit of Kuhn, one can look at the comments of several high office holders of the American Psychological Association.

McKeachie argues that the behaviorist "laws of learning have fallen from preeminence in basic learning theory and that in educational learning and other applications, we must also dispose them to a place in more complex structures."[9] This is an application of rule (3). The old blueprint omitted elements which seem necessary on empirical grounds. "If one hopes to use reward or knowledge of results to affect human learning, he needs to know something about what expectancies of reward the learner brings to the situation, both in terms of the incentive value of the reward and the learner's estimate of the probability of achieving the reward."[10] Cognitive elements must be added to the behaviorist paradigm.

But why has behaviorism been such a hit with psychologists, teachers, and counselors? "The answer," McKeachie thinks, "lies in its simplicity....those who buy this approach find that the basic ideas are simple to apply and work often enough to maintain their enthusiasm."[11] If we ignore those non-professional psychologists who have been sold a theory, and focus upon serious cognitive questions about the learning process, it looks in Maxwellian terms as if rule (1) has been dominating the scene. McKeachie's argument is that it is time to invoke rule (3).

Bandura has argued a similar case. "A survey of the literature on reinforcement confirms the extent to which we have become captives of a one-sided paradigm to map a bidirectional process. Environmental control is overstudied, whereas personal control has been

relatively neglected."[12] Moreover, this "goes considerably beyond the concept of countercontrol.[13] Again, rule (3) is being invoked. "Although the empirical issue is not yet completely resolved, there is little evidence that rewards function as automatic strengtheners of human conduct. Behavior is not much affected by its consequences without awareness of what is being reinforced."[14] Cognitive elements cannot empirically be omitted from the analysis of behavior as the behaviorist paradigm demands.

Boneau has also sought to widen the behaviorist view, but for reasons more in line with rule (4). He sees various highly polished areas of psychology which should be organized into a coherent structure. "While behaviorist approaches tend to imply that behavior is under external control, as expressed in the widespread use of the term stimulus control, the decision-theory/information-processing approach, on the other hand, seems to imply that behavior is determined primarily by events within the organism and permits behavior to be based on cognitive processes of various kinds."[15] Moreover, this opens up a possibility, which traditional behaviorist thinking excluded, "of building a bridge between such areas as operant conditioning and information processing, both of which have been developing in experimental psychology relatively independently of each other."[16] Boneau is going for more than rule (1) simplicity, for he believes that "some obvious substantive advances may fall quickly and simply out of fresh paradigms, or

complex formulations may become simplified."[17] The reference to simplicity is not rule (1) simplicity, but rule (4) fruitfulness.

These views of three psychologists, two APA presidents and a director of APA programs and planning, provide an initial warrant for the claim that the metamethodological rules which Maxwell found at work in physics are also quite visible in psychology.

What does this metamethodology mean for the problem of establishing a paradigm or blueprint for research on teaching? As we have seen in Section I, the process-product paradigm is under fire for not delivering successful results; and some researchers are turning away from it in search of an alternative framework for their inquiries. This suggest that Maxwell's rule 3 is applicable; since we are having little or no success empirically, the blueprint should be broadened; but we should do so in such a way as to maximize simplicity (rule 1) and fruitfulness (rule 4). The remainder of this paper is concerned with how the process-product paradigm may be so broadened.

IV. Theories of Mind as Blueprints

There is tradition in philosophy of education which views the basic ontological perspective which we seek as being found in theory of mind. Pai quotes Bode:

> How we teach is conditioned by what we assume the nature of learning to be....As soon as we undertake to create a special environment, in the form of a school for the special purpose of promoting learning, we become involved in the question of what learning is. Our conception of learning has a direct bearing on method. It also

> has a bearing on educational aims or objectives because the question of what learning is can be answered only in terms of what the mind is; and our conception of the mind, in turn, will decide what we consider to be "good" for the mind, in terms of an educational program.[18]

For Bode, conceptions of mind are prerequisites for learning theory, which is in turn a prerequisite for pedagogical theory. I think that Bode was right in his ordering but misleading in his representations in the relationships involved. That is, it is hard to believe that one could justify a theory of teaching without reference to a theory of learning; furthermore, it seems only logical that a conception of learning will be logically preceded by a conception of mind.

The difficulty in Bode's statement stems from the fact that theory of mind and theory of learning are temporal peers. That is, these inquiries should mutually feed each other. Neither seems to be completable without the fruits of the other. This is not to say that one could have a theory of learning independent of any commitments as to a conception of mind. This was, I take it, Bode's point.

I want to go one step bolder and venture the claim or hypothesis that philosphy of mind is, as an inquiry, the analysis and criticism of the metaphysical basis for learning theory. This seems particularly clear in Pai's discussion of the relationships between theory of mind and theory of learning.[19] For example, Broad's, Ewing's, and Ducasse's defense of dualistic

interactionism seem to be arguments against rejecting this view of mind as a metaphysical framework for scientific exploration. Moreover, Skinner has long held that his behaviorism is "a philosophy of science." When he argues against inclusion of anything mental in psychology, he is obviously concerned with the metaphysical basis of psychology.

It has not always been clear within the philosophy of mind literature or the psychological literature just which claims were logically necessary and which were logically contingent. Maxwell's metamethodological rules clarify, to the extent that his thesis is valid, the role of logical and empirical data in these issues.[20]

Philosophy of mind can clarify the metaphysical basis of learning theory but it is doubtful that it can provide such a basis for reserach on teaching, other than providing: (1) a blueprint for thinking about student goals and objectives; and, (2) a view of the teacher qua learner--how the teacher learns from teaching. In other words, I doubt Bode's claim that our views of learning "have a <u>direct</u> bearing on <u>method</u>." However we interpret 'direct', there is doubt that the gap between learning and teaching is to be bridged in any one straight-forward way.

It is a mistake to take, <u>a priori</u>, the blueprint for learning theory as the blueprint for teaching. Maxwell warns social science against aping the methods of physical science, for he holds that

their level two methodologies will be quite different due to their different aims. But this raises a parallel warning for the study of teaching: attempting to ape the methodology of psychology in the study of teaching may be stultifying.

Finally, the research in philosophy of education on the concept of teaching seems to parallel the research in the philosphy of mind. While it is often called "analysis" it is a kind of logico-ontological inquiry which seeks to delineate the concept of teaching. Ordinary usage is often appealed to as warrant for conclusions. Analysis of teaching in this vein produces conservative results. How the term "teaching" is used in ordinary language is not nearly as important as what empirical researchers are reasonably allowed to assume. Newer efforts in philsophy of education are bolder, i.e., past meanings of 'teaching' are not seen as limits to our creative abilities in constructing and reconstructing our ideas about how people may go about promoting the cognitive/affective development of others.

V. Sources of an Alternative Paradigm

How can we broaden the process-product strategy along the lines suggested by Maxwell's rules? What would it be like to give up the search for causes? Are there other types of analyses one could conduct of teaching. A causal analysis reasons from part of one whole to part of another whole: part of teaching is analyzed in terms of part of learning. We think we know the whole of learning through psychology and our

"basic philosophy". The point of our method is to build up the whole for teaching. But what if we reverse this and begin with some wholistic conception of teaching and then proceed to analyze the parts of this whole? Is there any precedent for this in any type of inquiry?

The cluster theory of definitions in science asserts that for some scientific terms it is impossible to give the necessary and sufficient conditions for the establishment of their extension. Oblong, sour, yellow, contains seeds, grows on trees, etc. are the cluster properties for defining 'lemon'; but these are not necessary and sufficient conditions. If we discovered a fruit which was at maturity not yellow but green and was like a lemon in all other ways we would, according to cluster theorists, call it a lemon as opposed to announcing the discovery of a new fruit. Yellow is a dispensible property though it is nevertheless a defining characteristic of lemon. Achi nstein has formulated the methodology for analysis of this type of definition.[21] This methodology offers a possible clue to how to study teaching in non cause-effect ways.

	Necessary and Sufficient Condition View	Cluster View
Definition	A	B
Hypothesis	C	D

The cluster theory of definitions (B) is an alternative to the view that scientific definitions should set necessary and sufficient conditions for the use of terms (A). It occurs to me that the process-product paradigm's search for independent (teacher) variables which are necessary and sufficient for dependent (student achievement) variables (C) has an alternative which is similiar to that for its parallel in definitions, i.e., a cluster view of hypotheses. Achinstein has set out the rules for cluster definitions. Can these rules be used to illuminate what one might think of as "cluster hypotheses"? Before attempting to do so, we need a bit more wood for the fire.

Another source for an alternative is offered by P. G. Smith's distinction between instrumental value and contributory value.[22] Instrumental value is established causally. The link between means and ends is a causal one. Throughout the instrumental value theory literature the means/end relation was always assumed to be organic not analytic. A contributory relationship is, on the other hand, a relationship of the part to the whole or totality. The part does not cause the totality--the whole is more than the sum of its parts. An architect who sets out to design a Gothic church has the concept (totality) of Gothicness in mind and seeks to construct an example or exemplification of the concept within the various limits of the wishes of his client. He knows what totality he seeks but must select the parts to be used and

set them in an affective relationship with each other. As Villemain once wrote,

> When steps, door, posts, etc., are conceived as symbols because their qualitative consequences upon each other add to their objective, it is then possible to note the relationships and use them to institute the qualitative consequences that will conform to the quality or form of a Roman, Gothic, or Colonial doorway.[23]

Each part of the doorway is assessed in terms of its contribution to the whole desired, say a Gothic doorway.

There is a notable difference between causal and contributory analyses. The former consider effects for which their causes are unknown, e.g., respiratory cancer. The cause and effect are independently definable and measureable—indeed they must be to carry out such analyses. One may observe an effect without any trace of the cause being present. What is called the principle of the "plurality of causes" emphasizes this point. Contributory analyses, on the other hand, differ in that the parts of the whole are observable within that whole or totality. The posts and steps of which Villemain wrote are there to be studied in a way in which causes are not. Contributory analyses are a matter of extricating elements and relationships.

VI. An Alternative Strategy

From these notions, I think an alternative conception of how we might go about studying teaching can be formulated. The analysis of teaching based upon contributory thinking evaluates a proposed teacher characteristic in terms of its contribution

to a teaching totality. But what is such a totality? What takes the place in teaching that Gothicness takes in architecture? Are there basic general abstract "forms" in teaching?

Harry Broudy has for some time written of three "distinguishable types" of teaching which he names: didactics, heuristics, and philetics. Didactics is "any instruction in which the contents can be made explicit and in which the criteria for successful learning are objective."[24] Heuristics is a "type of teaching that promotes learning by discovery or by problem solving."[25] In philetic teaching the teacher concentrates on "the emotional adjustment of the pupil."[26] Any given teacher characteristic may be important for one type of teaching and irrelevant to another. The techniques of good lecturing are relevant to didactical teaching but are inappropriate for the other two; or put differently, any given characteristic of teachers may contribute more to one of Broudy's types than another just as a certain doorway may contribute more to one kind of architecture rather than another.

I want to duck the question of whether Broudy has the right three, or how one goes about discovering and justifying claims about forms of teaching. One need not be skeptical here, for the same questions apply to architecture. We could in both cases imagine a Dewey-type evolutionary account of the emergence of distinct forms in both architecture and teaching.

As I have heard Philip G. Smith point out on several occasions, in teaching we lack the "professional mode" of evaluation found in other professions.[27] In medicine or law we do not judge the competence of a professional solely by means of the client outcomes. We believe there are rules or standards for practice; these define "standard practice" and are appealed to in malpractice cases.

In teaching we have a long history or experience with the profession. Standard forms of practice have emerged. Of course, this standard practice will contain much error; that is the trouble with conventional wisdom as opposed to tested wisdom. One task of research on teaching is to purge the mythology from standard practice. It should be noted, however, that there is also some wisdom in the traditional ways of doing things. When student teachers are told to go do something different--"experiment" one wonders what would happen if other professions did so as well. The trial and error teacher is a hack. Students should be protected from them.

But there is a kind of dilemma: on the one hand, we know standard practice is contaminated with error; on the other hand, standard practice is the summary of human experience with the professional practice. How can we continue with what is good while removing what is bad?

Broudy's types of teaching can be seen as aspects of standard practice which have filtered or sifted out over the years. Our

problem now is to try to further refine these types so that they are more error free in concept and their consequences upon students are more fully known. It is to the methodology of the former that we now turn.

A teacher characteristic C is a relevant characteristic to some whole or totality (W) if and only if the fact that an individual possesses C tends to count toward taking the individual to be an instance of that totality. The claim of relevance is a claim that there exists a part to whole relationship. Achinstein,[28] in analyzing cluster concepts, submits the notions of positive and negative relevance which are helpful here. Characteristic C is positively relevant to totality W if and only if the fact that an individual (i) possesses C tends to count more toward i's being an instance of W than the fact that i lacks C tends to count against i's being being an instance of W. C is negatively relevant to W if and only if the fact that i lacks C tends to count more against taking it as a W than the fact that i possesses C counts for it as W. If the totality in question is "good university teacher", "having a doctorate" has negative relevance while "liked by students" has positive relevance.

Given two relevant properties, one is more central to W than the other if and only if the fact that i has C_1 counts more toward taking it as W than the fact that i has C_2 counts for its being W. As stated, both C's are taken as having positive relevance; but

both could have negative relevance or be of mixed relevance. Centrality, thus, is a matter of degree of relevance.

The notions of relevance and centrality provide a basis for developing product-free pedagogical hypotheses. The independent variables are the parts of the whole while the dependent variables are the wholes themselves. These product-free pedagogical hypotheses explain contribution.

One last point of methodology is noteworthy. One might claim that what has been said thus far is incomplete in that so far only the parts as individual elements have been mentioned. But what of the relationship between parts? Is this not another structural component of totality? A rose window is quite central to being Gothic. But some rose windows will contribute more to a structure's being counted as a good exemplification of Gothicness than will other rose windows. Rosé windows are part of the defining characteristics of Gothicness; but all Gothic structures are not of equal worth. Aesthetic analyses will have to take into account relationships as well as elements. (Note, the question of good teaching may be better seen as a problem in aesthetics rather than ethics.)

We could perform a kind of conceptual clarification of one's ideas about good teaching using the above notions of relevance and centrality. Given a list of teacher characteristics a person considers important, we could further examine them for their relevance and centrality, thus clarifying one's ideas about teaching.

But more importantly, rather than having to know the specific effects caused or produced by a given teacher characteristic to determine whether it is a characteristic of good teaching, we can, using this method, determine what this characteristic contributes to a global teaching type. The cluster concepts as well as their relevance weightings would have to be determined for each type of pedagogy identified by Broudy.

What this amounts to is the construction of a different kind of pedagogical hypothesis. As noted in Section V, the product-process paradigm required hypotheses which had independent teacher-variables and dependent student-variables. The alternative paradigm requires hypotheses with teacher characteristics as independent variables and teaching wholes as dependent variables.

Once the defining conditions are explicated (or at least beginning to emerge) so we could delimit the extension of each type, the rules of combination could be hypothesized. That is, what are the proper relationships between the elements of heuristic teaching; i.e., what is good heuristic teaching?

The solutions to both the definition problem and the relationship problem would I think involve more than philosophical analysis. Empirical questions are also involved. What are thought to be good examples of teaching would have to be studied--just as good examples of architecture are studied. Video tapes, etc., would be of use here. But rather than trying to find causally reactive elements of teaching, one would look for the most central

contributing elements. Moreover, by knowing these, one would be in a position to raise questions about how our students are better prepared to teach.

One might fear that this method is circular: we use certain criteria to select good examples of, say, heuristic teaching and then proceed to analyze out these very criteria. This fear can be shown to be ungrounded, however, by the assumption of contributory methods. Firstly, the totality is always greater than the sum of the parts. There is nothing metaphysical in this beyond the point that in addition to the parts there are their relationships which are also constitutive of the totality. Secondly, it seems to be the case that human beings can perceive wholes without perceiving the parts thereof. We come to like the building before we are actually aware of the parts. At times it takes a competent architect to explain to us why we like a certain building or house. Likewise it is assumed that heuristic teaching can be judged on the whole with its specifics remaining unjudged.

One very important consequence of this way of viewing teaching is that one of the frustrations of the causal strategy is overcome: it is expected that no one characteristic or set of characteristics will be causally necessary in producing learning. One could find several effective teachers who have very little in common that is significantly different from other less effective teachers. Poor architecture will still have doors, windows, etc.; yet good

examples of Gothic and Roman buildings have little in common. What is different between good and not so good teachers is not on this model to be found in looking at which characteristics good teachers have and poor teachers lack; rather, the difference is to be found in what each characteristic present contributes to the whole. The quality of the whole is not a sum of the quality of the parts. Moreover, teacher evaluation becomes a matter of how well a particular person exemplifies a particular form in a particular situation.

VII. Evaluation of the Product-Free Process Paradigm

The suggested alternative to the process-product paradigm is actually a strategy for developing independent variables for pedagogical hypotheses. But now it should be asked how this strategy compares with those mentioned above. As noted, the product-process paradigm assumes teacher effects are stable across time. This assumption is irrelevant to the construction of product-free pedagogical hypotheses. It is, however, relevant to testing for the effects of the teaching types upon various kinds of students. The second assumption is that teacher effects are generalizable across settings. Again, this assumption is not directly relevant to the paradigm.

The third and fourth assumptions are, however, directly relevant. The assumption that the frequency of teacher behavior is the most significant aspect of teaching is explicitly rejected.

One cannot look only at most frequent elements in doing contributory analyses. The parts in relationships are the most significant aspect of teaching. The fourth assumption, that the causal direction is from teacher to student, is rejected. In heuristics, for example, there is a causal interaction between teacher and student. The proper moves for a heuristic teacher are determined by the moves made by students. Once could not study heuristic teaching independently of what the students are doing.

The product-free paradigm offers an advantage over the culture-of-the-school paradigm in that it focuses upon certain kinds or instances of teaching which it takes to be more significant for research than other kinds or instances. The culture-of-the-school does not discriminate between classrooms worth studying and those that are not.

Finally, the student mediating paradigm does not improve our assumptions about the teacher though it does add to what is involved in the total pedagogical relationship. It may turn out that this paradigm can be incorporated into the product-free paradigm. The present paper will not explore the possibility.

In an earlier paper I argued that it was a mistake to attempt to evaluate particular teachers in terms of the particular people being taught.[29] A second paper[30] commented that the use of intact classrooms without estimating the number of children therein with student purposes may be quite inappropriate. Both papers

argued from different perspectives that it is misleading to view teaching as the ultimate cause of learning. It was feared that teachers would too quickly resort to coercion and/or artificial rewards to get children to become students.

The present proposal being about generalized teaching forms cannot it seems avoid the question of effects upon children's purposes and learning. Drawing from the second paper mentioned above, we expect that a teaching form will produce not learning but the conditions for learning. It is an empirical question as to the effects of, say, heuris tics on children. Does it inspire them so that they become students? Does it work better in some situations than in others? When is didactics more appropriate? I do not think that these questions are answered simply by reference to "objectives" or "goals". All three must be held accountable for their ability to create or destroy student purposes. It is probably more correct to see both instructional objectives and different kinds of student purposes as being the determiners of which teacher type is appropriate. But it is open as to how the teacher types are best evaluated.

This paper suggests that research on teaching is a tandem process: an analysis of part to whole relationships which constitute identifiable global types of teaching; on the other hand, the caused effects of each type upon children must also be analyzed. I hope that one can now see that the method of basic

empiricism is not going to be able to produce a more complete view or theory of teaching. There are some undeniable logico-ontological questions about teaching which philosophy of education is better equipped to answer than is a narrowly conceived empiricsm.

VIII. Teacher Evaluation

There is a further consequence of the product-free paradigm which should be considered. Our conception of teaching should be such as to allow us to "see" what is involved in teacher evaluation. The paradigm or blueprint developed here does provide such illumination.

To evaluate an object (a book, teacher, theory, principle, principal, etc.) is basically a matter of comparing it to some standard or set of criteria. This involves establishing what properties are rendered by the criteria being relevant to the evaluation of the object. Such properties are called in the literature "good-making" or "bad-making" characteristics (though "better-making" and "worse-making" are probably more descriptive of actual evaluations). One then examines the object of evaluation to see if it possesses these characteristics in such a fashion that warrants its being considered acceptable, adequate, better than another object of that kind, and so forth. In the case of a categorical property we ask whether the object of the evaluation (the evaluandum) possesses the property. If the property is continuous then we ask whether the evaluandum possesses it in sufficient degree.

From discussion thus far it is transparent that there are two aspects involved in the use of standards, or as one could say, two aspects of competent evaluation. One must both know which standards are appropriate and be able to apply these in particular situations. Thus, there is a kind of theory-practice separation in evaluation. Errors in evaluation could occur in either (a) the use of inappropriate standards, or (b) the misapplication of standards. The latter is more empirical while the former is more philosophical in nature.

The question of how to evaluate faculty is thus a question of how to (a) find or build standards or criteria to be used to assess the worth of individual faculty members, and (b) utilize these criteria in specific cases or instances. It is the first of these problems with which we shall be concerned.

Of course, evaluation is fairly straightforward, though not necessarily simple, when the criteria are established; but which characteristics of the total possible set of characteristics a thing possesses are the good- and bad-making ones? In a practical educational context, the issue is usually one of choosing between various competing sets of proposed criteria. But again, how is this reasonably done? It is well-known that observation and rating systems tend to incorporate teacher characteristics which (1) correlate poorly with student achievement measures--except for possibly "clarity of presentation" and "knowledge of subject

matter", and (2) reflect the values or biases of their writer rather than what we know about teaching. How can one put together a more objective rating system? This is to ask how one can determine which faculty characteristics are admissible to the evaluation process.

The problem of criterial admissibility is the logical problem of what counts as an adequate justification of criteria or standards for assessing the worth of an object. If one were to propose or hypothesize that property P is a characteristic of good teaching, and is therefore a criterion of good teaching, how would we go about accepting or rejecting this claim?

If we knew the components of didactic, heuristic, and philetic teaching, the appropriateness of each teaching type given specific curricula and students, then we would know the criteria relevant for the evaluation of teaching. We would know how to construct rating scales, etc., which would take the right factors into account.

As is often pointed out, when evaluators use a rating form to assess a teacher's performance there is a tendency to rate a particular characteristic on the basis of one's overall judg ment about the person as teacher. This point may seem to cut against the method of analysis being considered. From my experience quite the opposite seems true. If one were schooled in contributory methodology, I would predict a decrease in the tendency to

allow one's overall opinions of the person to influence the rating of individual characteristics. But this remains to be seen.

But equally important, we would begin to see how the data generated from student opinions about the quality of teaching should be used--as well as how not to use them. Client-satisfaction data are, it seems, often misused by faculty. It would be a mistake to adjust one's teaching solely on the bases of client-satisfaction responses. This is not to say that such data are useless; they obviously are not. But how are they best placed?

Consider the teacher who wants to teach students to be philosophers or at least to be philosophic about education. He or she engages in a heuristic form of teaching. Perhaps the students have only known didactic teaching. They may well be negative in their responses. If the faculty member adjusts performance solely in terms of these responses, he or she may well be moved into the didactic mode--especially if both faculty member and students are unaware of the heuristics-didactics distinction.

This example suggests the need for exploring the possibility of providing some preteaching in which students would become aware of the different teaching forms as well as when each form is the appropriate one.[31] Students should be made intelligent consumers of teaching. The old point that education is learning how to learn can be fortified by adding that this involves learning how to learn from teaching.

Notes

1. Walter Doyle, "Paradigms In Teacher Effectiveness Research," A.E.R.A. presentation, 1975, pp. 7-8.

2. Ibid., pp. 10-13.

3. "Paradigms In Educational Inquiry," Educational Theory, Vol. 25, No. 1 (Winter 1975), pp. 28-39.

4. "The Rationality of Scientific Discovery, Part I: The Traditional Rationality Problem" Philosophy of Science, Vol. 41, No. 2 (June 1974), pp. 123-153; and, "The Rationality of Scientific Discovery, Part II: An Aim Oriented Theory of Scientific Discovery," Philosophy of Science, Vol. 41, No. 3 (September 1974), pp. 247-295.

5. Ibid., pp. 257-8.

6. Ibid., p. 262.

7. Ibid., p. 263.

8. Ibid., p. 257.

9. "The Decline and Fall of the Laws of Learning," Educational Researcher, Vol. 3, No. 3 (March 1974), p. 8.

10. Ibid., pp. 9-10.

11. Ibid., p. 10.

12. "Behavior Theory and the Models of Man," American Psychologist, Vol. 29, No. 12 (December 1974), p. 866.

13. Ibid., p. 867.

14. Ibid., p. 860.

15. "Paradigm Regained?," American Psychologist, Vol. 29, No. 5 (May 1974), p. 298.

16. Ibid.

17. Ibid.

18. Boyd H. Bode, How We Learn (Boston: D. C. Heath and Co., 1940), pp. 5-6.

19. Teaching, Learning, and the Mind (Boston: Houghton Mifflin Co., 1973).

20. It also offers an alternative to McMurray's De gustibus non est disputandum view of theory of mind. "Concepts of Mind and Intelligence in Educational Theory," Educational Theory, Vol. 25, No. 3 (Summer 1975), p. 240.

21. Concepts of Science, Prentice-Hall, 1968.

22. P. G. Smith, "Knowledge and Value", Educational Theory (Winter 1976): 29-39.

23. F. T. Villemain, An Inquiry into the Nature of Aesthetic Subject-Matter, unpublished doctoral thesis, (1942).

24. The Real World of the Public Schools (1972), p. 60.

25. "Three Modes of Teaching and Their Evaluation", National Symposium for Professors of Educational Research (1974).

26. Real World, p. 60.

27. Philip G. Smith, "The Structure of Evaluations in Education," AERA presentation, 1976.

28. See note 21.

29. "Studying" in R. Pratte (ed.) Proceedings of the Philosophy of Education Society (1974): 174-184.

30. "Science of Pedagogy and Teacher Education," Midwest Philosophy of Education Society Presentation, 1976.

31. Katie Popp has emphasized this point by drawing from the counseling parallel. In many cases, precounseling has been shown useful.